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AMERICAN CHEMICAL SOCIETY.

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1884.

COMMITTEE ON PAPERS AND PUBLICATIONS:

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The **Journal of the American Chemical Society** appears monthly, except during July and August. It will contain all papers read before the Society, as well as abstracts from American and Foreign Journals, and a list of American Patents relating to Chemical Industries.

The Price of Subscription is $5.00 per year, in advance.

The Meeting Room and Library of the Society are at Room 1, University Building, Washington Square, New York.

The Regular Monthly Meeting is held on the first Friday of every month, at 8 P. M. A *Conversazione* is held on the third Friday of every month, at the same hour.

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The Committee on Papers and Publications respectfully call attention to the resolutions of the Society, requiring that papers be submitted to the Committee before being read.

Members who cannot be present at the meetings, are requested to send their papers in care of the Committee, who can guarantee prompt publication of all articles accepted.

Authors will be furnished, gratis, with 20 reprints of each article published in the Journal, if application for the same be made when the article is sent.

Members are requested to notify the Committee of any change of address, or failure in the delivery of the Journal. All communications relating to the Journal should be addressed in care of

A. A. BRENEMAN, 97 Water St., New York.

PROCEEDINGS OF THE AMERICAN CHEMICAL SOCIETY.

REGULAR MEETING—November 7th, 1884.

The meeting was called to order at 8:40 P. M., Dr. J. C. Booth in the chair.

The minutes of the meetings of September 19th and October 3rd were read and approved.

The following gentlemen were elected members of the Society.

George H. Weiss, 100 Bedford avenue, Brooklyn, E. D.

E. A. Von Schweinitz, of the University of North Carolina, Chapel Hill, N. C.

Launcelot W. Andrews, 419 Broadway, Cambridge, Mass.

Conrad Braker, Jr., of 215 Pearl street, New York, was elected an Associate.

The following Associates were proposed for regular membership:—

Nathaniel Hathaway, New Bedford, Mass.

Clement Le Boutillier, 50 East 25th street, New York.

Charles A. Wittmack, P. O. Box, 1032, New York.

All proposed by F. V. Pool, Wm. Rupp, and J. B. Mackintosh.

Dr. J. C. Booth read a paper on Graphite or Black Lead Crucibles.

* Dr. C. E. Munsell distributed copies of his report to the New York State Board of Health on Fresh and Condensed Milk.

Dr. Leeds moved that a meeting of the Board of Directors be called for Thursday, November 13th, at 4 P. M., at 117 Pearl street, carried.

Drs. Waller, Endemann and Munsell were appointed a Committee on Nomination of Officers for the year 1885.

The following papers were announced:

Mr. J. H. Stebbins. On the Spectroscopic Examination of Methylen Blue and Lauth's Violet.

Dr. A. R. Leeds. On a New Form of Butyrometer.

The meeting was then adjourned.

C. E. MUNSELL,
Recording Secretary.

* A copy of this report will be sent to members of the Society on application to the author, 128 Worth street, N. Y.

GRAPHITE, OR BLACK LEAD CRUCIBLES.

By J. C. Booth, Ph.D.

The use of graphite for pencils, stove blacking, lubricating surfaces, &c., is extremely limited, compared with its enormous value and consumption in crucibles, employed in melting gold, silver, copper, brass, bronze, German silver, &c., and especially in smelting the finest steel for tools, for the tires of locomotive driving wheels, and even for the ponderous shafts of the great ocean steamers; in short, wherever the finest quality of steel is demanded in the arts. Such steel being a marked expression of the physical power of civilization, the chief means of procuring the black lead crucible has the strongest claim on our attention.

In studying its manufacture I shall successively consider, 1. the materials employed; 2. their preparation and mixture; 3. the formation and completion of the crucible.

Materials.—A black lead crucible is essentially composed of graphite or black lead ground to fine scales, which are rigidly held in their position by partially melted clay ground up with powdered graphite and a little sand, the last being added to prevent shrinkage while drying, and the dried crucible, made from this mixture, is finished by burning at a high heat.

Since black lead is virtually pure carbon, the question arises why might not the cheapest form of carbon, Anthracite, be substituted for it? Because of the difference in their mechanical structure and their behavior to heat.

All the forms of carbon combine with the oxygen of the air at a high heat, and gradually burn away into carbonic acid or oxide, but graphite burns much more slowly than any other form (except the diamond). All the forms except graphite, at a strong heat, below combustion, crackle into a fine, structureless powder, or are easily ground into powder, the particles of which have no property or means of cohesion, nor of adhesion to other bodies, and cannot therefore be made into a tough, coherent crucible.

Black lead has an eminently laminated, crystalline structure, breaking into thin scales, but not at right angles to their plane, for, however thin a piece may appear to the eye, it breaks into still thinner scales, of the same structure and toughness as the original. A single thin scale held in a delicate forceps shows a remarkable

degree of elasticity, when bent, by springing back to its original position unaltered. Neither a low heat nor a white heat will make it exfoliate.

It appears, then, that the distinctive properties of graphite for crucibles are, that it retains the flat or scaly form, even under hard grinding, and at the highest heats; that the scales are extremely elastic and tough, and that it resists combustion in the air much more than the ordinary forms of carbon.

Varieties of Graphite.—It occurs in three forms, the elastic laminated, the elastic fibrous, and the more amorphous variety. As the elastic fibrous variety may be used indifferently with the scaly, and is quite rare, we need not dwell upon it. I have termed the third form *more* amorphous, because it sometimes has the external appearance of the scaly variety, and does often contain some of it. A little experience will enable one to distinguish it by the eye, and a simple test will establish a more reliable estimate of value. A minute quantity, finely ground in a mortar, will approximately show the proportionate quantity of scaly and shapeless powder, and the conclusion may be strengthened by sifting it through a piece of fine muslin, when the eye can sufficiently determine the relative quantity of each. Since the amorphous variety, although deceptively crystalline in appearance, adds but little, if anything, to the strength of a crucible, the manufacturer should avoid its use as much as practicable. I think that my experience will bear me out in saying, that only at an enormous reduction in relative price, and even then only a small proportion of it, compared with the best scaly kind, will warrant the manufacturer of black lead crucibles in employing it, at the great risk of his reputation, for the best black lead crucible.

Commercial graphite occurs as "lump-lead," "grains" and "dust." During some years' experience in making black lead crucibles, I found that by far the greater part of the graphite of commerce consisted of the excellent scaly variety, whether in lump or grains, and therefore giving no pretext for using inferior graphite, except the unsoundness of false economy. I found a barrel entirely filled by one piece of the best Ceylon graphite, and single lumps of several pounds weight each, are of frequent occurrence and of the best quality. A few of the smaller lumps, up to ½ lb. weight, are of the deceptive amorphous variety, which is, however, more often present in the fine powder with an iron black, lustreless appearance. Graph-

ite in clean, sifted grains, free from powder, is generally of excellent quality. The best variety has a silvery lustre, the next lower grade, although it may be of fair quality, has a bright, steel lustre, and the lower the grade the more it puts on an iron black, or sometimes a brownish tint.

I have found the impurity of ground commercial lump lead of the best quality to be about 6 per cent., and to consist chiefly of quartz and iron pyrites. On the other hand, I have seen silvery graphite in grains of the uniform size of about $\frac{1}{8}$ inch, and without dust, which was almost absolutely pure carbon.

Localities.—Graphite is abundantly distributed in metamorphic rocks, but rarely in large masses together. Many localities have been explored with a view to its use for crucibles, but almost all were successively abandoned, because of the excessive cost of extraction, and in a few cases because of its inferior quality.

The island of Ceylon contributes the great mass of black lead to commerce; 14,000 tons having been shipped from it in 1883. Most fortunate is it that nearly all of it is of the best quality.

We find small quantities of it sparingly distributed in all the States of the Union and in every country on the globe where metamorphic influences have imparted a crystalline structure to the lower geological formations. It has been extracted at several different times from the locality in Philadelphia, Penn., within ten miles of the centre of the city, and with partial success. The quality is good, but lacks mass *in loco*.

When called upon to explore the locality, I took the bearing of the adjacent gneiss, &c., and, applying it to the shaft which struck the graphite, I found it pointed exactly to the various openings from which the latter had been extracted. The rocks in contact with and containing the graphite, are so highly metamorphosed and confused with crystallization, that the planes of stratification are only recognizable by experience. Since the rocks are stratified, they were once deposited sands and clays, with the remains of plants that grew on them, condensed and modified into coal, which probably passed through the changes of lignite, bituminous coal and anthracite into graphite.

(*To be continued.*)

ABSTRACTS.

Arseniomolybdic Acid. O. PUFAHL.

Barium molybdate, when suspended in an aqueous solution of arsenic acid and decomposed with the equivalent amount of H_2SO_4, yields a yellow solution, which on concentration deposits crystals of arseniomolybdic acid. Crystallizing in orange red doubly-refracting needles not affected by the atmosphere. (*Ber. d. ch. Ges., 213, 1884.*) J. H. S., JR.

Chemical Action with Carbon and its Compounds. G. GORE.

A series of 44 experiments in which the attempt is made, through a variety of reactions, to separate carbon in the elementary state, and to discover new facts in regard to carbon and some of its compounds. (*Chem. News L. 125.*) A. A. B.

On the connection between Pseudo Solution and True Solution. W. W. J. NICHOL.

The well known Brownian motion of small particles suspended in a liquid being regarded as a consequence of molecular impacts, is applied by the author to support the *molecular* as distinguished *hydrate* theory of solution. According to the former theory, the solution of a salt in water is a consequence of the superior attraction of the molecules of water for those of the salt as compared with the cohesion of the salt itself. Substances are soluble in inverse proportion to their cohesion. Cohesion being destroyed by subdivision, a finely divided substance remains suspended for a long time in water. Such suspension or *pseudo solution* differs only from true solution in respect to fineness of division of the solid. If subdivision could be carried to the isolation of the molecules, true solution would result, and substances thus dissolved, could separate from solution only slowly in spite of the superior cohesion of their molecules, because aggregations of these molecules sufficiently large to separate themselves from solution could only occasionally be found. As an instance of this we have slow precipitation of many insoluble substances from solution when cold and dilute. (*Chem. News L. 124.*) A. A. B.

On Pyridine-Carbo-Acids. E. NÖLTING and A. COLLIN.

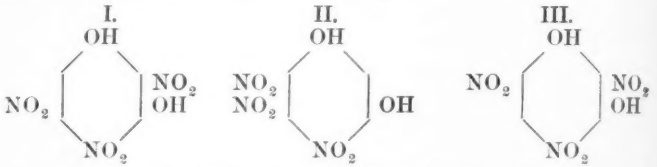
I. The pyridinecarbo-acid, which is obtained from chinoline by oxidizing with potassium permanganate, has both its carboxyl-groups in the ortho-position. It may therefore he looked upon as a phthalic acid, in which a CH group has been replaced by a nitrogen atom.

II. ON THE FORMATION OF BLUE FROM ROSANILINE.

It is known that when aniline, orthotoluidine, or paratoluidine are treated to 180° C. with rosaniline and benzoic acid, a blue dyestuff is formed. Metatoluidine acts similarly. (*Ber. d. ch. Ges.*, *258 1884*,). J. H. S., JR.

On the Constitution of Styphnic Acid. E. NÖLTING and A. COLLIN.

Styphnic acid, or trinitroresorcine, can have only one of the three following constitutional formulæ, viz.:



Bantlin, who obtained it from metanitrophenole, gives it the formula indicated under I. In I. as well as in II., two of the nitro-groups hold symmetrical positions in relation to one another, and according to Laubenheimer's rule, should, when heated with alkalies, be split off as nitrites.

III. if converted into the corresponding ether, and then treated with alkalies, would split up into styphnic acid. The authors conclude that styphnic acid is constituted as represented under formula III. (*Ber. d. ch. Ges.*, *281*, *1884*.) J. H. S., JR.

On Nitrosophenoles. H. GOLDSCHMIDT.

In a previous article the author described certain compounds produced by the action of hydroxylamine on diketones and chinones. This article is a continuation of the previous one, and describes the behavior of benzochinone and β-naphthochinone towards hydroxylamine. 1 part chinone was dissolved in 300 parts

H_2O, and to this was added an aqueous solution of hydroxylamine chloride. The mixture was now allowed to rest for 12 hours until the smell of chinone had disappeared. It was then shaken up with bone black, filtered, and extracted with ether. After concentrating the solution in vacuo, long, colorless needles were obtained, which on analysis were found to be benzochinoneoxim. β-naphthochinone and hydroxylamine chloride yielded β-naphthochinoneoxim. (*Ber. d. ch. Ges., 210, 1884.*) J. H. S., Jr.

On the Separation of Zinc and Nickel. T. Moore.

Evaporates to reduce excess of acid, dissolves residue in 20–25 c. c. of water, precipitates with excess of ammonium sulphide, dissolves precipitate in solution of KCN, with aid of heat, and dilutes to 250 c. c.; then adds a few c. c. of sodium acetate solution, acidifies with acetic acid and heats to boiling. ZnS separates; it is allowed to stand several hours, then washed by decantation with hot water containing a little sodium acetate and H_2S; the precipitate is weighed after conversion to ZnO. Filtrate and washings are evaporated to dryness with aqua regia, the residue is dissolved, and the solution precipitated with KHO and Br. The precipitate is finally dissolved in H_2SO_4, and after addition of NH_4HO, Ni is precipitated by the battery. Results very accurate and process rapid. (*Chem. News L. 157.*) A. A. B.

A New Test for Nitrous Acid. Raphael Meldola.

Para-amidodimethylaniline, on being treated with nitrous acid, is converted into the diazo-compound—$C_6H_4.N\begin{cases}N=N-R.\\ N=N-C_6H_4N(CH_3)_2.\end{cases}$

The tetrazo-salt $C_6H_4\begin{cases}N_2.Cl.\\ N_2C_6H_4N(CH_3)_2\end{cases}$ possesses the remarkable property of assuming a deep blue coloration when its dilute aqueous solution is exposed to the air; this property makes it valuable as a test for nitrous acid.

In order to prepare the substance, paranitraniline is diazotized in the usual manner, and combined with the theoretical amount of dimethylaniline. The crystalline precipitate formed is collected on a filter, washed and reduced with ammonium sulphide. The

reduction product is poured into cold water, which, after a while causes the basic matter to separate. This is collected on a filter, washed and dissolved in dilute HCl., in the proportion 0.5 grm. to 1 litre. This solution has a deep red color.

If a solution is to be tested for nitrous acid, add a few drops of the coloring matter to it, then a few drops of HCl, and finally, add ammonia till the blue coloration appears.

This test shows the reaction with a solution composed of $\frac{1}{64}$ grm. $NaNO_2$, in one litre H_2O, or 1 pt. $Na.N^2O$ in 6,400 pts. of water. This dyestuff may be kept in solution a long time without deterioration. (*Ber d. ch. Ges., 256. 1884.*) J. H. S., JR.

On Dyestuffs, resulting from the Simultaneous Oxidation of Paradiamines with Monamines. R. NIETZKI.

In a previous communication it was shown that the dyestuffs produced by the simultaneous oxidation of paradiamines with monamines are converted by reducing agents into bases which are amido-derivatives of diphenylamine. Thus Bindschedler's dimethethyphenylen green splits up, on reduction, into tetramethyldiamido diphenylamine. Shortly after this Majirt applied for a patent in which he described a process for producing methylen blue by the oxidation of a sulphuretted hydrogen solution of tetramethyldiamidodiphenylamine. The author had likewise observed this reaction, but comes to the conclusion that methylen blue had not been formed synthetically from tetramethyldiamidodiphenylamine. On treating a sulphuretted hydrogen solution of the above base with Fe_2Cl_6 the solution turns green, but not blue. Thus dimethylphenylen green is formed, notwithstanding the large excess of ferric chloride. Only after long standing and repeated addition of H_2S and Fe_2Cl_6, did he succeed in obtaining a pure blue solution, from which only 5% coloring matter was obtained. The formation of methylen blue may, however, be easily explained. Dimethylphenylen green is easily decomposed with acids, splitting up into chinones, dimethylamine and dimethylparaphenylendiamine, viz.: $C_{16}H_2N_3Cl + 2H_2O = C_6H_4O_2 + NH(CH_3)_2 + (CH_3)_2N\text{-}C_6H_4NH_2 + HCl$.

It is therefore probable that the dimethylparaphenylendiamine, in the nascent state, on coming in contact with the sulphuretted hydrogen is converted into methylen blue. If the blue were

formed directly from the dimethylphenylen green a much larger yield should be obtained than is actually the case. (*Ber. d. ch. Ges., 217, 1884.*) J. H. S., Jr.

On the Detection of Adulterations in Portland Cements.

R. Fresenius and W. F. Fresenius.

The analysis is treated under the following heads :

(*a*) Specific gravity.

(*b*) Loss of weight on ignition.

(*c*) Behavior with water, including alkalinity of aqueous solutions.

(*d*) Behavior with dilute acids.

(*e*) Behavior with permanganate solution.

(*f*) Behavior with CO_2.

(*a*) This is determined by Schumann's method, which depends upon the space occupied by a volume of cement of known weight. The cement is introduced into a graduated flask filled with turpentine. The change of level is noted. The number of c. c. replaced by the cement, divided by the weight of the latter, give the Sp. Gr. It was found that pure Portland cement has a density of not less than 3.1, whereas adulterated cements have much lower densities.

(*b*) Two grms. cement are heated in a platinum crucible over a Bunsen burner to constant weight ; 20 minutes heating is sufficient.

(*c*) The behavior of cements with water is characteristic. Various samples treated in the same manner impart to water different amounts of alkaline matter.

1 grm. of finely pulverized substance is shaken up with 100 c. c. distilled water for 10 minutes, the mixture filtered, and 50 c. c. of the filtrate titrated with $\frac{1}{10}$ volume HCl. The results indicate a decided difference between Portland and hydraulic cements.

(*d*) 1 grm. substance, finely pulverized, is treated with 30 c. c. in HCl and 70 c. c. water, and shaken up for 10 minutes, then filtered, and 50 c. c. of the filtrate titrated back with NaHO. From the figures so obtained the number of c. c. HCl, neutralized

by 1 grm. of cement, are calculated. These figures are lower for slag powder than for Portland cement.

(*e*) 1 grm. finely pulverized cement is treated with 150 c. c. of a mixture of 1 pt. dilute H_2SO_4 (sp. gr. 1.12) and 2 pts. H_2O, and then permanganate* sol. is run in until the solution reddens. 1 grm. Portland cement decolorizes from 0.17—0.53 c. c. corresponding to 0.79—2.8 mg. $KMnO_4$. Various samples of slag powder required from 9.5—16 c. c. corresponding to 44.34—74.67 mg. $KMnO_4$.

(*f*) This test is made to determine whether the so-called free lime, which should not be found in Portland cements, exists in hydraulic cements.

3 grms., finely powdered, are placed in a weighed glass tube, and submitted to the action of dry carbonic acid, at the ordinary temperature, for two hours. The increase in weight gives the amount of CO_2 absorbed. 3 grms. cement should not absorb more than 1.8 mg. CO^2. Cements yielding figures which do not fall within these limits may be regarded as adulterated. (*Fres. Zeit.*, 1884, 175.) J. H. S., Jr.

Copper Oxychloride as a Paint. T. Maxwell Lyte.

In a letter to the editor of the *Chemical News* the author suggests the use of copper oxychloride for painting the interior of water tanks, and points out that while the salts of copper and mercury are active poisons to plants and infusorial life, the salts of the latter are too violently poisonous to be used in this case. Insoluble salts of copper, like the oxychloride, on the contrary, while fatal to vegetable growths and microbia, would be less liable to contaminate water for domestic use than the lead paints commonly used. The copper salt should be isolated from the surface of the iron by a coating of magnesia or zinc paint upon which it could then be laid. (*Chem. News L. 152.*) A. A. B.

* 24.30 c. c. permanganate represents 0.2 grms. Fe. dissolved as ferrous salt.

Abstract of American Patents Relating to Chemistry.

From the Official Gazette of the U. S. Patent Office.

(*Addenda to April 8th, 1884, p. 203.*)

296,433.—Manufacture of paper.—W. Rupp.

Substitutes infusorial earth for a portion of the paper stock in the manufacture of absorbent paper.

June 17, 1884.

300,352.—Tanning process.—S. S. Eddy.

First subjects the pickled hides to an acidulating composition, washes drains and completes the operation of tanning with an alkaline tanning com position.

300,383.—Apparatus for distilling wood.—J. A. Matthieu.

300,384.—Distillation of wood.—J. A. Matthieu.

300,385.—Retort for carbonizing wood.—J. A. Matthieu.

The above three patents cannot be described without the specifications and drawings.

300,436.—Process of removing tannic acid from coffee.—H. H. Beach.

Treats coffee for the removal of tannic acid and other deleterious substances therefrom by heating the green coffee to 212° Fahr., and removes the matter extracted from the berry.

300.464.—Compound material for the manufacture of sheets, boards, blocks, artificial wood, etc.—L. Haas.

Vegetable fiber, leather or shoddy waste, crude asbestos, litharge and thinned asphaltum blended with sulphur, pitch and whiting.

300,466.—Process and apparatus for manufacturing gas.—J. Hanlow.

Decomposes steam by means of heated fuel, charges with hydrocarbon and fixes the mixture of gas and vapors in a previously heated fixing chamber.

300,497.—Apparatus for treating leather stock with naptha to extracts oils.—F. F. Newall.

300,560.—Compound for the manufacture of artificial stone.—H. Bening.

Sand, cement, oxalic acid, chalk, muriatic acid, iron filings and water.

300,599.—Process of and apparatus for crystallizing tin.—G. R. Habe nicht.

Consists in heating and cooling the plates, subjecting them to a solution of caustic soda to remove the oxide coating and finally developing the crystallization by subjecting the plates to the action of an acid.

300,700.—Method of manufacturing starch.—H. Duryea.

Applies a solution of alkali to the condensed starch water by which a stratification of the resultant liquor into a solution of starch, and one of glutinous matters is effected, and removes them separately.

300,729.—Fire and waterproof compound.—O. F. Parsons.

Coal tar, air-slaked lime, Spanish brown, sulphur, litharge, fine salt and American ochre.

300,747.—Process of treating iron.—B. Woodruff.

Consists in repeated heating at increasing temperatures, alternated with rolling or pressing into it sand, common salt, black oxide of manganese, and before or after fashioning the metal as required, heating it to about a welding point and hardening or tempering it.

June 24th, 1884.

300,752.—Apparatus for generating gas or vapor from liquid hydrocarbons.—A. J. Ambler.

300,778.—Process of and apparatus for treating fibrous plants.—J. A. Hitter.

Subjects them to the action of steam which has passed through a solution of sulphate of iron and soft soap.

300,802 and 300,803.—Process of and apparatus for manufacturing illuminating gas.—S. C. Salisbury.

300,811.—Apparatus for the continuous distillation of oil.—H. C. Smith.

Fractional distillation of the oil, which descends through a series of pipes arranged in an inclined plane in a heated chamber.

300,826.—Process of producing steel from wrought iron with plumbago.—W. A. O. Wuth.

Charges the furnace with pieces of wrought iron having a low percentage of phosphorus in layers with a thin stratum of plumbago between the layers of iron, melting the charge in the open hearth and finally adding to the melted metal spiegeleisen or ferro-manganese.

300,874.—Production of coloring matter from dinitrophenal.—F. Krüger, G. Tobias and E. Kegel.

Production of dinitrophenolsulphonic acid and its salts, by means of nitrating phenolsulphonic acid or mononitrophenolsulphonic acids or their salts.

300,890.—Liquid cement for giving a cheap and durable metal coating to papiermache, plaster of paris, clay, &c.—F. Philipp.

300,928.—Apparatus for the manufacture of vinegar.—A. Wecker.

Not intelligible without the drawing.

300,950.—Process of an apparatus for the separation of metals from ores and alloys.—H. R. Cassel.

Consists in charging the auriferous ore or alloy in a powdered condition into an anode compartment, which is separated from the cathode compartment by porous material, said anode compartment containing a solution yielding nascent chlorine under the action of an electric current, and agitating the powdered material within the said solution during the passage of the electric current.

300,951.—Process of chloridizing ores by electrolysis.—H. R. Cassel.

Subjects the ore to the action of a solution yielding chlorine under electrolytic decomposition.

301,006.—Art of manufacturing fermenting materials.—F. A. Reihlen.

A ferment composed of a foundation of a vegetable fiber and of a deposit of fungoid growths formed thereon.

301,015.—Filtering composition.—R. M. Sommers.

Gravel, white bar-sand, animal charcoal and phosphate of lime.

301,033.—Apparatus for concentrating sulphuric acid.—M. Willett.

Not intelligible without the drawing.

301,069.—Treatment of vegetable fibrous material.—A. Prinz.

Maceration in an attenuated solution of chloride of lime and subsequent boiling under pressure in an alkaline lye combined with a hydrocarbon or a sulphide of carbon.

10,491.—Reissue, Original No. 227,352, May 8, 1883.—E. Scherff.

Not intelligible without the specification.

July 1st, 1884.

301,092.—Apparatus for generating heating gas.—S. N. Carvalho.

The gas is produced from hydrocarbons with the aid of steam, superheaters &c.

301,149.—Mixed paint.—H. C. Petty.

For the preparation of which no less than fifteen more or less compatible substances are required.

301,222.—Sulphur refining apparatus.—F. Dickert.

301,248.—Treating phosphates of alumina and iron.—G. A. Liebig and J. F. Gibbons.

Not intelligible without the specification.

301,383.—Manufacture of carbonate of strontium.—E. A. Mebus and J. W. De Castro.

Consists in reducing sulphate of strontium into an exceedingly fine condition, in mixing it with sufficient water to maintain it in suspension therein and in treating it with carbonate of ammonium or ammonia and carbonic acid.

301,390.—Ice and refrigerating machine.—P. G. and C. A. Randall.

Relates to improvements in an ammonia ice machine.

301,406.—Manufacture of alkaline phosphates.—S. G. Thomas.

Consists in treating in a basic lined Siemens furnace or Bessemer converter alkaline chlorides with molten phosphoric iron and an air blast or iron oxide, washing the gases for hydrochloric acid, lixiviating the resulting phosphatic slag and precipitating the solution with milk of lime, whereby caustic alkali and precipitated calcium phosphate are obtained.

301,407.—Manufacture of alkaline phosphates.—S. G. Thomas.

Manufactures soluble alkaline phosphates from phosphoric non-silicious

molten pig iron in a basic lined Siemens furnace or Bessemer converter by pouring the molten metal upon an alkaline carbonate in such a furnace or vessel, turning on the blast, and with the blast introducing a further quantity of the carbonate, the alkali rising through the bath and combining with the nascent phosphoric and silicic acids and forming a slag of phosphate and silicate of soda and potash, then running off this slag while hot, lixiviating it, and evaporating or precipitating the solution with milk of lime.

301,436.—Method of manufacturing starch.—H. Duryea.

Combines the condensed starch water with a solution of caustic alkali, agitates the mixture about four hours and then separates the nearly pure starch from the glutinous solution.

301,457.—Ice machine.—J. Patten.

An ice machine where cold is produced by the vaporization of a portion of the ice, alternate moistening of the surface of the ice, then exposing it to a high vacuum, causing the moisture and a portion of the ice to vaporize at the expense of heat from the remaining portion of ice, thereby reducing its temperature, so that when it is again brought in contact with water a thin layer will freeze and congeal to it.

July 8th, 1884.

301,469.—Process of and 301,469, Apparatus for treating and improving petroleum.—H. R. Angus.

Consists in floating the oil on heated water in a closed tank, continuously introducing steam or heated water therein, flowing off the surplus water at the surface to impart motion to the oil toward the outlet, and at the same time forcibly removing the volatile products generated from the oil.

301,475.—Process of printing indigo colors.—J. Bracewell.

Prepares the fabric with a solution of grape sugar or glucose, then prints a mixture of alkali and indigo upon such fabric and subjects the same to the action of steam.

301,518.—Apparatus for the manufacture of lamp black.—F. K. Plumbly.

Mechanical arrangements for collecting the cooled lamp black and conveying it to a receiver.

301,531.—Apparatus for manufacturing gas.—J. L. Stewart.

Steam is decomposed by incandescent fuel, the gases mixed with the vapors from coal and oil and converted into a fixed gas in a fixing chamber.

301,617.—Process of and apparatus for manufacturing artificial stone.—A. A. McCandliss.

Washes the sand with water, steam and sulphuric acid, mixes with a plastic material, places the molded shapes in a curing room and again subjects them to steam, the vapors of sulphuric, hydrochloric or carbonic acids.

301,636.—Portable distilling apparatus.—L. Smith.

301,708.—Apparatus for the treatment of bones, phosphatic residues, &c.—C. W. Flodquist.

Not intelligible without the drawing.

301,782.—Composition for removing scale from steam boilers.—A. Wilson.

Decoction of tan bark, ooze and catechu, logwood, chestnut leaves, spruce hemlock leaves, gallnuts and sumac bark, carbonate of soda, oil of sassafras and alcohol.

301,783.—Method of refining and deodorizing oils and fats.—E. S. Wilson.

Consists in first forming a soap or emulsion of the material with caustic soda lye by heat and then applying chlorinated alkaline or chlorine to it.

301,802.—Manufacture of yellow coloring matter.—H. Caro and H. Kern.

As a new product, the yellow coloring matter or dye stuff described in the specification, which, when dissolved in alcohol and treated first with sodium-amalgam and then with acetic acid and heat, is decomposed into tetramethyl-diamido-benzhydrol and ammonia.

July 15th, 1884.

301,894.—Filtering apparatus.—C. F. Holdship.

A filter consisting of a series of removable sections for filtering petroleum and similar liquids.

301,910.—Barometer.—J. Y. McCleary.

301,971.—Apparatus for reclaiming glutin or glutinous matters from the spent liquor of starch works.—W. Duryea.

A combination of mechanical devices for obtaining the above result.

302,130.—Gas generating and consuming furnace for heating retorts.—J. T. Hasse.

Not intelligible without the drawings.

302,132.—Tanning and dressing old leather and articles of same.—E. M. Hewitt.

302,138.—Bleaching-Keir.—C. L. Jackson and J. Westley.

302,158.—Process of producing a metal high in phosphorus and carbon and low in silicon.—J. Reese.

Consists in smelting iron ores with suitable charges of coke, limestone and phosphorized basic slag in a blast furnace, and then running the molten metal into a silicious-lined open hearth and treating it therein until the metal begins to boil and the elimination of the carbon commences, whereby a metal high in phosphorus and carbon and practically free from silicon is produced.

302,163.—Apparatus for cooling and impregnating air and other gases.—J. A. Saladin.

Brings air or other gas continuously into contact with water or other liquid in finely divided condition.

302,170.—Manufacture of brown coloring matter.—J. H. Stebbins, Jr.

As a new product, the brown coloring matter described in the specification, which, when treated with reducing agents—such as tin and hydrochloric acid—splits up into beta-amidophenanthrene, aniline, and sulphanilic acid.

July 22nd, 1884.

302,266.—Treating phosphates for fertilizers.—G. A. Liebig and J. F. Gibbons.

Relates to the treatment of mineral phosphates containing iron and alumina for the purpose of converting them into complete commercial fertilizers.

302,294.—Method of and apparatus for compressing and liquefying gases and producing refrigeration.—J. J. Suckert.

302,326.—Apparatus for purifying water.—R. d'Heureuse.

Forces air through the water.

302,387.—Sugar mixing and cooling apparatus.—G. Engel.

Mechanical device for bringing the sugar into contact with large volumes of air.

302,443.—Process of absorbing heat from rooms or material by use of a liquefied gas.—J. J. Suckert.

July 29th, 1884.

302,544.—Bluing paper.—G. A. Conant.

Paper saturated with solution of Prussian blue, oxalic acid and sugar.

302,646.—Composition and manufacture of brick or artificial stone.—G. R. Bare and J. A. Douglass.

Sand, cement, water, water slaked lime, asbestos, coloring matter, molded and passed successively through soap and alum baths.

302,679.—Process of making and composition for pavements and other purposes.—J. E. Wynkoop.

Furnace slag, sand, Portland cement and lime water.

302,739.—Process of and means for filtering and decolorizing syrups and saccharine juices.—F. Kleeman.

Consists in first adding to the liquor broken or pulverulent brown coal, tertiary coal, lignite, or peat, and then passing the liquor through the usual filtering device.

302,742.—Composition for filling wood.—M. Kunz.

Alcoholic solution of finely ground glue and benzine or oil of turpentine.

302,790.—Azo-coloring matter.—A. Spiegel.

An azo-compound derived from dichlorphenolbetanaphthol, being distinguished by its being soluble in water with a yellow color, and when an alkali is added to the solution, or when boiled with a nitrite, the bisulphite compound is decomposed and a bluish violet salt is precipitated.

302,791.—Fastening azo-colors on yarn or textile fabrics.—A. Speigel.

Impregnates such fibre or fabric with the bisulphite compounds of azo-coloring matters formed from diazo-compounds, combined with aromatic hydroxylated bodies or phenols, together with salts of alumina, iron or chromium, and then exposing the fibre so impregnated to the action of heat or to the action of an alkaline agent, or of a hot solution of a nitrite.

302,800.—Manufacture of hydrogen dioxide.—M. Traube.

Consists in bringing water and a flame of carbonic oxide or other gas into contact with each other.

302,819.—Cartridge and method of waterproofing the same.—P. Aarbe.

August 5th, 1884.

302,882.—Apparatus for ageing of liquors.—E. H. Ashcroft.

Injects air.

302,909.—Apparatus for the manufacture of gas.—G. W. Harris and A. L. Allen.

302,970.—Cleansing compound.—J. B. Ziebach.

Deodorized gasoline, sulphuric ether, alcohol, egg, oil of citronella, and oil of lavender.

303,065.—Process of bleaching vegetable tissues.—J. A. Southmayd.

Treats first with permanganate of potash to destroy coloring matter, then neutralizes with oxalic acid, sulphite of sodium, &c.

303,093.—Process of and apparatus for the manufacture of compressed asphaltum blocks.—W. S. Wilkinson.

303,141.—Process of separating the insoluble from the soluble matter in corn and malt mashes.—A. E. Ferve.

Adds towards end of boiling, for each barrel, about one ounce of Irish moss or gelatinous substance.

303,142.—Process of manufacturing beer, syrup, &c.—W. E. Ferve.

Consists in first saturating the corn meal with cold water, then adding malt in limited proportion, then heating the mixture, causing the starch cells to burst, then separating the liquid constituents from the solids, and then adding the remainder of the mash.

303,144.—Laundry bluing.—C. Franke.

Concentrated mixture of ultramarine, glucose and water.

303,146.—Composition of matter for the production of artificial slate.—H. Gallinowsky.

Burned bones, white lead and linseed oil.

303,213.—Compound for making bricks, artificial stone, &c.—H. A. Cooke.

Slaked lime, resin, sand, oxide of iron, gypsum and cement.

303,221.—Process of treatment of textile vegetable fibers.—E. Fremy and V. Urbain.

The fibers are boiled in an alkaline lye, the quantity of which is based upon an analysis of the fiber.

303,232.—Process of separating gold and silver from arsenide of iron.—E. Probert.

Consists in first melting the substance, tapping it out into pots lined with refractory material, and then introducing granulated litharge or lead into it while yet in a fluid state.

303,236.—Phosphorized alloy of copper and aluminium and process of making the same.—T. Shaw.

Aluminium from one-third of one per cent. to five per cent., phosphorus from one-twentieth of one per cent. to one per cent., and the remainder copper.

303,237.—Battery for generating electricity.—G. G. Skrivanow.

Contains a negative element coated or covered with chloride of silver, and having potassic or sodic caustic alkaline solution as the liquid in which the positive and negative elements are immersed.

August 12th, 1884.

303,277.—Apparatus for the manufacture of white lead.—G. H. Smith.

303,278.—Manufacture of white lead.—G. H. Smith.

Consists in submitting metallic lead while in a closed chamber to the corroding action of acid, vapor, and air introduced in regulated quantity and proportions under the conditions of temperature and outside pressure as set forth in the specification.

303,301.—Art of making artificial asphaltum from the residue of tanneries.—C. Lortzing.

303,335.—Azo-coloring matter.—A. Spiegel.

The new coloring matter, the bisulphite compound of dichlorphenolazo ethylbetanaphthol, the same being soluble in hot water, with a yellow color and when an alkali is added to this yellow solution or when it is boiled with a nitrate it is decomposed easily, and a bluish violet salt of the azo-coloring matter is precipitated.

303,371.—Manufacture of fertilizing materials.—F. L. Harris.

Saturates phosphates, &c., under pressure in a closed vessel with liquor extracted from animal substances.

303,376.—Process of purifying saccharine liquids.—O. H. Krause.

Extracts the sugar from the impurities retained in the bag filters by diluting the latter, adding lime, heating and then separating the sugar by means of filter presses.

303,378.—Bone black kiln.—F. O. Matthiessen.

A retort for a bone black kiln, composed essentially of an upper section, which is ventilated for the purpose of carrying off vapors and gases driven out of the bone black by preliminary application of heat, and a lower section composed of a group of vertical pipes, in which the bone black is subjected to a higher degree of heat, and is at the same time kept from contact with the air.

303,379.—Bone black kiln.—F. O. Matthiessen.

A series of retorts, each of which consists of a ventilated section, surmounting a heating section composed of a longitudinally corrugated pipe contained within a suitable heating chamber in combination with a circularly arranged group of cooling pipes beneath the heating chamber.

303,436.—Method of hardening or improving resins of all kinds.—A. Kissel.

Neutralizes the acids contained in the resins, resinous by-products, &c., with lime or other alkaline earths.

303,437.—Process of making ferrocyanides.—H. Kunheim.

Precipitates ferrocyanide of calcium from its solution by means of chloride of potassium for the production of ferrocyanide of potassium or other ferrocyanide.

303,443.—Process of washing raw sugar.—F. O. Matthiessen and G. Dinkle.

A series of mechanical operations for removing the greater part of the impurities from raw sugar in an economical manner.

303,456. Furnace for desulphurizing and deoxidizing ores.—J. H. Rae.

303,514.—Process of extracting cobalt from ores.—H. Herrenschmidt and M. Constable.

Consists in subjecting the pulverized ore to the action of finely divided sulphate of iron with water or heat or both, whereby the iron is converted into oxide and the cobalt into sulphate.

303,571.—Furnace for roasting zinc and other ores.—E. C. Hegeler.

303,586.—Furnace for reducing and smelting ores.—J. C. Newbery, J. L. Morley and B. Cleveland.

Reissue No. 10,507.—Apparatus for extracting gold and silver from their ores.—R. Barker.

Original Patent No. 273,011 of February 27, 1883. An amalgamation process aided by electricity.

August 19th, 1884.

303,616.—Waterproofing starched fabic.—R. H. Buel and H. L. Brevoort.

The surfaced goods are treated with a solution of paraffine in benzine or naphtha, and afterwards subjected to heat to render them water repellent.

303,736.—Apparatus for distilling chloride of zinc.—A. Jamieson.

Not intelligible without the drawing.

303,776.—Process of defecating and clarifying saccharine liquors.—J. F. and O. Willcox.

Albumen solution is added, then dilute solution of acid, and the liquor heated to 190° Fahr. After this operation it is neutralized with lime, dilute acid in small quantity again added and the liquor filtered.

303,779.—Manufacture of white lead.—W. V. Wilson.

Converts part of the carbonate of lead in hydrated oxide of lead by treating the former with caustic potash.

303,913 and 303,915.—Desiccating apparatus. H. B. De Witt.

309,914.—Apparatus for desiccating fertilizers.—H. B. De Witt.

303,930.—Art of treating and utilizing the refuse or waste products resulting from starch manufacture.—P. H. Grimm.

Adds the pressed finely divided nitrogenous residuum to the coarse refuse after the greater part of water has been pressed out of the latter.

303,962.—Method of obtaining carbonate of of magnesia.—A. Wünsche.

Forms ammonium magnesium carbonate by introducing ammonia and carbonic acid into a solution of a soluble magnesium salt. The double carbonate is then separated from the lye and worked up into carbonate of or caustic magnesia. O. H. K.

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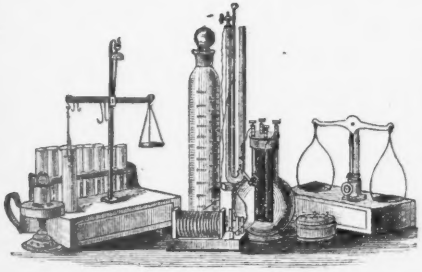

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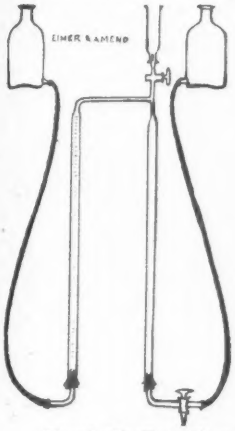

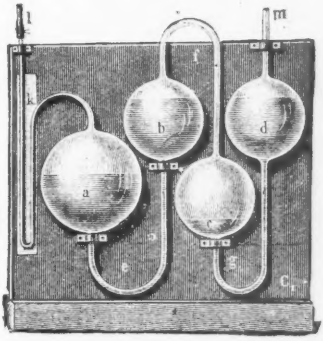

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